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NEWS	12	AUG 02 Cplus and CA patent records enhanced with European and Japan Patent Office Classifications
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SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

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0.21

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FILE COVERS 1907 - 30 Aug 2004 VOL 141 ISS 10

FILE LAST UPDATED: 29 Aug 2004 (20040829/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s ep 02342610/pn

L1 0 EP 02342610/PN
(EP2342610/PN)

=> s ep0342610/pn

L2 1 EP0342610/PN
(EP342610/PN)

=> d l2 ibib ab

L2 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1990:161010 CAPLUS

DOCUMENT NUMBER: 112:161010

TITLE: Process for the coproduction of higher alcohols, methanol and ammonia

INVENTOR(S): Patel, Nitin Madhubhai; Wang, Shioou I.

PATENT ASSIGNEE(S): Air Products and Chemicals, Inc., USA

SOURCE: Eur. Pat. Appl., 9 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 342610	A2	19891123	EP 1989-108784	19890516 <--
EP 342610	A3	19920219		
R: DE, GB, NL				
US 4886651	A	19891212	US 1988-195576	19880518
PRIORITY APPLN. INFO.:			US 1988-195576	19880518
OTHER SOURCE(S):	CASREACT 112:161010			

AB The title process comprises: (a) catalytically reforming a first methane-containing stream with the steam and CO2 to form a first H and

CO-containing synthesis gas, (b) removing CO₂ from the first synthesis gas and recycling a portion of the CO₂ to the reformation, (c) rejecting a portion of the H content of the first synthesis gas to produce a first CO-rich synthesis gas and a H stream, (d) catalytically reforming a second methane-containing stream with steam and CO₂ to form an initial methane, H and CO-containing synthesis gas and further reforming the initial synthesis gas by partial oxidation with an O-enriched gas to result in a second H- and CO-containing synthesis gas, (e) removing CO from the second synthesis gas and recycling a portion of the CO₂ to the catalytic reformation to step d, (f) combining the H stream with a N-rich stream and catalytically reacting the combined stream to produce NH₃, (g) combining said first and second synthesis gas streams and catalytically reacting them to produce higher alcs. and a purge stream of residual unreacted synthesis gas at an elevated pressure, and (h) reacting the purge stream to produce MeOH. This process produces MeOH and EtOH which cannot be produced by olefin hydroformylation process. A process schematic is presented.

=> s integrated process and hydrocarbon (1a) synthesis and ammonia

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171045 INTEGRATED
  1 INTEGRATEDS
171045 INTEGRATED
    (INTEGRATED OR INTEGRATEDS)
1970456 PROCESS
1310104 PROCESSES
2930828 PROCESS
    (PROCESS OR PROCESSES)
  1441 INTEGRATED PROCESS
    (INTEGRATED (W) PROCESS)
309641 HYDROCARBON
308929 HYDROCARBONS
476083 HYDROCARBON
    (HYDROCARBON OR HYDROCARBONS)
1137642 SYNTHESIS
  3 SYNTHESISES
  62379 SYNTHESES
1172979 SYNTHESIS
    (SYNTHESIS OR SYNTHESISES OR SYNTHESES)
  3552 HYDROCARBON (1A) SYNTHESIS
176197 AMMONIA
  118 AMMONIAS
176249 AMMONIA
    (AMMONIA OR AMMONIAS)
L3      0 INTEGRATED PROCESS AND HYDROCARBON (1A) SYNTHESIS AND AMMONIA

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=> s integrated process fischer tropesch and ammonia

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171045 INTEGRATED
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1310104 PROCESSES
2930828 PROCESS
    (PROCESS OR PROCESSES)
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    15 FISCHERS
  21845 FISCHER
    (FISCHER OR FISCHERS)
  7028 TROPSCH
    0 INTEGRATED PROCESS FISCHER TROPSCH
      (INTEGRATED (W) PROCESS (W) FISCHER (W) TROPSCH)
176197 AMMONIA
  118 AMMONIAS
176249 AMMONIA

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(AMMONIA OR AMMONIAS)
L4 0 INTEGRATED PROCESS FISCHER TROPSCH AND AMMONIA

=> s hydrocarbon synthesis and ammonia synthesis
309641 HYDROCARBON
308929 HYDROCARBONS
476083 HYDROCARBON
(HYDROCARBON OR HYDROCARBONS)
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3 SYNTHESISES
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1172979 SYNTHESIS
(SYNTHESIS OR SYNTHESISES OR SYNTHESSES)
1943 HYDROCARBON SYNTHESIS
(HYDROCARBON(W)SYNTHESIS)
176197 AMMONIA
118 AMMONIAS
176249 AMMONIA
(AMMONIA OR AMMONIAS)
1137642 SYNTHESIS
3 SYNTHESISES
62379 SYNTHESSES
1172979 SYNTHESIS
(SYNTHESIS OR SYNTHESISES OR SYNTHESSES)
5041 AMMONIA SYNTHESIS
(AMMONIA(W)SYNTHESIS)
L5 8 HYDROCARBON SYNTHESIS AND AMMONIA SYNTHESIS

=> s 15 and synthesis gas
1137642 SYNTHESIS
3 SYNTHESISES
62379 SYNTHESSES
1172979 SYNTHESIS
(SYNTHESIS OR SYNTHESISES OR SYNTHESSES)
1374678 GAS
473270 GASES
1544425 GAS
(GAS OR GASES)
14724 SYNTHESIS GAS
(SYNTHESIS(W)GAS)
L6 2 L5 AND SYNTHESIS GAS

=> d 16 ibib ab

L6 ANSWER 1 OF 2 .CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:144628 CAPLUS
DOCUMENT NUMBER: 132:168340
TITLE: Cryogenic air distillation for preparation of impure
oxygen fraction for manufacture of **synthesis**
gas by hydrocarbon reforming or partial oxidation
INVENTOR(S): Rieth, Norbert; De Bussy, Francois
PATENT ASSIGNEE(S): Air Liquide SA pour l'Etude et l'Exploitation des
Procedes Georges Claude, Fr.
SOURCE: Eur. Pat. Appl., 10 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 982554	A1	20000301	EP 1999-402116	19990825
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				

IE, SI, LT, LV, FI, RO

FR 2782787	A1	20000303	FR 1998-10813	19980828
FR 2782787	B1	20000929		
JP 2000203827	A2	20000725	JP 1999-241791	19990827
US 6247333	B1	20010619	US 1999-384981	19990830
PRIORITY APPLN. INFO.:			FR 1998-10813	A 19980828

AB Impure oxygen (containing 70-98 mol% O₂ and <2 mol% Ar) is provided by a cryogenic air distillation unit for use in a reforming or partial oxidation unit for production of **synthesis gas** (e.g., from hydrocarbon feedstocks). The nitrogen separated by the cryogenic distillation unit is then sent to an **ammonia synthesis** reactor. The crude **synthesis gas** from the reforming or partial oxidation step is then purified in a pressure-swing absorption unit to provide a hydrogen-rich fraction for use in the **ammonia synthesis** reactor. The impure oxygen stream may also contain 1-30 mol% N₂.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d 16 ibib ab 2

L6 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1968:468674 CAPLUS

DOCUMENT NUMBER: 69:68674

TITLE: Hydrogen or **ammonia synthesis gas**

INVENTOR(S): Squires, Arthur M.

SOURCE: U.S., 8 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 3397962	A	19680820	US 1965-433066	19650216
PRIORITY APPLN. INFO.:			US 1965-433066	19650216

AB In the preparation of H or NH₃-**synthesis gas** by catalytic reforming of hydrocarbons, a mixture of steam and hydrocarbon is passed downwardly through tubes containing the catalyst. The reformed gases are passed upwardly in countercurrent heat transfer relation with the mixture undergoing reforming. The upward flowing gases pass through several fluidized beds of calcined dolomite, each at a progressively lower temperature. The heat developed by the shift reaction and recarbonatation of CaO, together with the sensible heat derived from the upward flowing gases, is transferred by the fluidized solids to the gases undergoing reforming in the tubes. If NH₃ **synthesis gas** is wanted, a secondary reforming step with air is interposed between the bottom outlet of the catalyst tubes and the inlet of the lowest fluidized bed. Thus, substantially all of the sensible heat added to the gases during secondary reforming is used to drive the primary reforming. The catalyst tube walls can be relatively thin, and temperature regulation is simple.

=> s preparing ammonia and Fischer tropesch products

34144 PREPARING

98197 PREPG

12 PREPGS

98208 PREPG

(PREPG OR PREPGS)

119523 PREPARING

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                (PREPARING OR PREPG)
176197 AMMONIA
    118 AMMONIAS
176249 AMMONIA
    (AMMONIA OR AMMONIAS)
    13 PREPARING AMMONIA
        (PREPARING (W) AMMONIA)
    21833 FISCHER
    15 FISCHERS
    21845 FISCHER
        (FISCHER OR FISCHERS)
    7028 TROPSCH
1244630 PRODUCTS
    149 FISCHER TROPSCH PRODUCTS
        (FISCHER (W) TROPSCH (W) PRODUCTS)
L7          0 PREPARING AMMONIA AND FISCHER TROPSCH PRODUCTS

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=> s ammonia synthesis and fischer tropsch
    176197 AMMONIA
    118 AMMONIAS
    176249 AMMONIA
        (AMMONIA OR AMMONIAS)
1137642 SYNTHESIS
    3 SYNTHESISES
    62379 SYNTHESES
1172979 SYNTHESIS
    (SYNTHESIS OR SYNTHESISES OR SYNTHESES)
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        (AMMONIA (W) SYNTHESIS)
    21833 FISCHER
    15 FISCHERS
    21845 FISCHER
        (FISCHER OR FISCHERS)
    7028 TROPSCH
    6933 FISCHER TROPSCH
        (FISCHER (W) TROPSCH)
L8          27 AMMONIA SYNTHESIS AND FISCHER TROPSCH

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=> s l8 and synthesis gas
    1137642 SYNTHESIS
    3 SYNTHESISES
    62379 SYNTHESES
1172979 SYNTHESIS
    (SYNTHESIS OR SYNTHESISES OR SYNTHESES)
    1374678 GAS
    473270 GASES
    1544425 GAS
        (GAS OR GASES)
    14724 SYNTHESIS GAS
        (SYNTHESIS (W) GAS)
L9          3 L8 AND SYNTHESIS GAS

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=> d his

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FILE 'CAPLUS' ENTERED AT 12:04:28 ON 30 AUG 2004

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L1          0 S EP 02342610/PN
L2          1 S EP0342610/PN
L3          0 S INTEGRATED PROCESS AND HYDROCARBON (1A) SYNTHESIS AND AMMONIA
L4          0 S INTEGRATED PROCESS FISCHER TROPSCH AND AMMONIA
L5          8 S HYDROCARBON SYNTHESIS AND AMMONIA SYNTHESIS
L6          2 S L5 AND SYNTHESIS GAS
L7          0 S PREPARING AMMONIA AND FISCHER TROPSCH PRODUCTS

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L8 27 S AMMONIA SYNTHESIS AND FISCHER TROPSCH
L9 3 S L8 AND SYNTHESIS GAS

=> s l9 not l5
L10 3 L9 NOT L5

=> d l10 ibib ab 1-3

L10 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:207864 CAPLUS
DOCUMENT NUMBER: 139:182492
TITLE: HTI coal conversion technologies in China
AUTHOR(S): Zhòu, Peizheng; Lee, Theo L. K.
CORPORATE SOURCE: Hydrocarbon Technologies, Inc., Lawrenceville, NJ, USA
SOURCE: Preprints of Symposia - American Chemical Society,
Division of Fuel Chemistry (2003), 48(1), 155-157
CODEN: PSADFZ; ISSN: 1521-4648
PUBLISHER: American Chemical Society, Division of Fuel Chemistry
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review. Hydrocarbon Technologies, Inc. (HTI), together with Shenhua Group, developed several coal conversion technologies, including direct and indirect coal liquefaction, promoted skeletal iron catalyst, Slurry-Phase gas-to-liquid (GTL) Process based on skeletal iron catalyst, and Integrated Fuels-Ammonia Co-Production Process. Direct coal liquefaction is a technol. catalytically converting coal directly into liquid transportation fuels under hydrogen pressure and temperature. The indirect coal liquefaction technol. first gasifies coal into a mixture of hydrogen and carbon monoxide, called **synthesis gas** or syngas, which in turn is catalytically converted via **Fischer-Tropsch** (F-T) reaction into a range of hydrocarbons and oxygenates from methane to waxes. A promoted skeletal iron catalyst, under the tradename HTI ZIP, does not breakdown as easily as precipitated iron catalysts and is readily separable from waxy F-T products even by simple gravitation sedimentation, thus the catalyst/wax separation difficulty is avoided. A HTI GTL Process uses simple gravity settling for catalyst/wax separation and was tested to convert natural gas-derived syngas to produce petrochemicals. The HTI Integrated Fuels-Ammonia Co-Production Process was designed for small-size and medium-size, coal-based in particular, **ammonia synthesis** plants.

L10 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:115248 CAPLUS
DOCUMENT NUMBER: 134:165467
TITLE: Integrated process for converting hydrocarbon gas to liquids
INVENTOR(S): Gieskes, Thomas
PATENT ASSIGNEE(S): Atlantic Richfield Company, USA
SOURCE: PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001010979	A1	20010215	WO 2000-US21352	20000804
W: AE, AU, ID, TT				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 6248794	B1	20010619	US 1999-369045	19990805
EP 1204717	A1	20020515	EP 2000-955374	20000804
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				

TP 315.85

IE, SI, LT, LV, FI, RO, MK, CY, AL
AU 774815 B2 20040708 AU 2000-67589 20000804
EG 22777 A 20030831 EG 2000-1013 20000805
PRIORITY APPLN. INFO.: US 1999-369045 A 19990805
WO 2000-US21352 W 20000804

AB In a first embodiment, a **Fischer-Tropsch** (FT) process is integrated with a cryogenic liquefied natural gas (LNG) process wherein tail gas from (FT) reaction is used to drive a refrigeration compressor in the (LNG) process. The process may be further integrated with a fertilizer production process comprising an **ammonia synthesis** process and a urea synthesis process. To produce ammonia, hydrogen separated from **synthesis gas** produced in a primary and/or secondary reformer in the (FT) process is combined with nitrogen produced in the (LNG) process. Nitrogen may also be supplied to the **ammonia synthesis** process from an optional air separation process, which also provides oxygen enrichment to the thermal reformer in the (FT) process. The produce urea, the ammonia is subsequently reacted with carbon dioxide removed during processing of the gas prior to its liquefaction. In an alternative embodiment, an (FT) process is integrated with a methanol synthesis process wherein tail gas from the (FT) reaction is used to fuel burners in a secondary thermal reformer.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:433100 CAPLUS
DOCUMENT NUMBER: 122:191800
TITLE: Opportunities for technological advances in the conversion of natural gas to liquid fuels and chemicals
AUTHOR(S): Puskas, Imre
CORPORATE SOURCE: Research Services, Wheaton, IL, 60187, USA
SOURCE: Preprints of Papers - American Chemical Society, Division of Fuel Chemistry (1995), 40(1), 97-104
CODEN: ACFPAI; ISSN: 0569-3772
PUBLISHER: American Chemical Society, Division of Fuel Chemistry
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review with 57 refs. **Synthesis gas** from natural gas (steam reforming, carbon dioxide reforming, partial oxidation, combined reforming), **ammonia synthesis**, methanol synthesis, hydrocarbons via **Fischer-Tropsch** syntheses, gasoline via methanol, and comparative economics are discussed.

WEST Search History

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	<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L13	L12 not l6 or l7 or l8	19
<input type="checkbox"/>	L12	L11 and air separation	15
<input type="checkbox"/>	L11	production near4 ammonia near4 hydrocarbon\$1	229
<input type="checkbox"/>	L10	L6 not l8 not l7	13
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<input type="checkbox"/>	L8	L7 not l5	4
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<input type="checkbox"/>	L6	integrated process with ammonia with hydrocarbon\$1	17
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<input type="checkbox"/>	L3	L2 and synthesis gas	211
<input type="checkbox"/>	L2	L1 and air separation	233
<input type="checkbox"/>	L1	hydrocarbon\$1 near2 ammonia	3522

END OF SEARCH HISTORY

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NEWS	4	May 12 Polymer links for the POLYLINK command completed in REGISTRY
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NEWS	17	AUG 27 BIOTECHABS/BIOTECHDS: Two new display fields added for legal status data from INPADOC
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NEWS INTER		General Internet Information
NEWS LOGIN		Welcome Banner and News Items
NEWS PHONE		Direct Dial and Telecommunication Network Access to STN
NEWS WWW		CAS World Wide Web Site (general information)

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=> file caplus

COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

0.21

0.21

FILE 'CAPLUS' ENTERED AT 10:33:08 ON 30 AUG 2004

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FILE COVERS 1907 - 30 Aug 2004 VOL 141 ISS 10

FILE LAST UPDATED: 29 Aug 2004 (20040829/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s integrat? (3a) process (L) ammonia (l) hydrocarbon?

248976 INTEGRAT?

1970456 PROCESS

1310104 PROCESSES

2930828 PROCESS

(PROCESS OR PROCESSES)

176197 AMMONIA

118 AMMONIAS

176249 AMMONIA

(AMMONIA OR AMMONIAS)

477952 HYDROCARBON?

L1 2 INTEGRAT? (3A) PROCESS (L) AMMONIA (L) HYDROCARBON?

=> d l1 ibib ab 1-2

L1 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:507690 CAPLUS

DOCUMENT NUMBER: 139:55243

TITLE: Integrated synthesis gas manufacturing-Fischer Tropsch synthesis-nitrogen hydrogenation for manufacture of hydrocarbon liquids and ammonia fertilizers

INVENTOR(S): Zhou, Peizheng; Lu, Yijun; Rueter, Michael

PATENT ASSIGNEE(S): Hydrocarbon Technologies, Inc., USA

SOURCE: U.S., 8 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6586480	B1	20030701	US 2002-212534	20020806
CN 1473797	A	20040211	CN 2002-157452	20021219

PRIORITY APPLN. INFO.:

US 2002-212534

A 20020806

AB An **integrated process** for production of **ammonia**-based fertilizers and liquid **hydrocarbons** from a fossil-fuel feedstock (e.g., coal, natural gas and dry refinery gas) consists of initial partial oxidation-steam gasification to produce intermediate low-sulfur (<2 ppm) synthesis gas, (2) Fischer-Tropsch synthesis from 0.8-5.2:1 H₂-CO synthesis gas in the absence of a water gas shift reactor, and (3) passing nitrogen gas and unreacted H₂ in an **ammonia**-based synthesis facility for production of **ammonia**-based fertilizers (especially NH₃ and NH₄HCO₃). A preferred synthesis gas has a 1.0-2.0:1 H₂-CO ratio. **Hydrocarbon** (Fischer-Tropsch) synthesis is carried out at 300-510°F and 250-800 psi.

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:115248 CAPLUS

DOCUMENT NUMBER: 134:165467

TITLE: Integrated process for converting hydrocarbon gas to liquids

INVENTOR(S): Gieskes, Thomas

PATENT ASSIGNEE(S): Atlantic Richfield Company, USA

SOURCE: PCT Int. Appl., 38 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001010979	A1	20010215	WO 2000-US21352	20000804
W: AE, AU, ID, TT				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 6248794	B1	20010619	US 1999-369045	19990805
EP 1204717	A1	20020515	EP 2000-955374	20000804
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
AU 774815	B2	20040708	AU 2000-67589	20000804
EG 22777	A	20030831	EG 2000-1013	20000805

PRIORITY APPLN. INFO.: US 1999-369045 A 19990805
WO 2000-US21352 W 20000804

AB In a first embodiment, a Fischer-Tropsch (FT) process is integrated with a cryogenic liquefied natural gas (LNG) process wherein tail gas from (FT) reaction is used to drive a refrigeration compressor in the (LNG) process. The process may be further integrated with a fertilizer production process comprising an ammonia synthesis process and a urea synthesis process. To produce ammonia, hydrogen separated from synthesis gas produced in a primary and/or secondary reformer in the (FT) process is combined with nitrogen produced in the (LNG) process. Nitrogen may also be supplied to the ammonia synthesis process from an optional air separation process, which also provides oxygen enrichment to the thermal reformer in the (FT) process. The produce urea, the ammonia is subsequently reacted with carbon dioxide removed during processing of the gas prior to its liquefaction. In an alternative embodiment, an (FT) process is integrated with a methanol synthesis process wherein tail gas from the (FT) reaction is used to fuel burners in a secondary thermal reformer.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> s produc? (4a) ammonia (4a) hydrocarbon?
3891516 PRODUC?

```

      826601 PRODN
      528 PRODNS
      826781 PRODN
            (PRODN OR PRODNS)
      4295896 PRODUC?
            (PRODUC? OR PRODN)
      176197 AMMONIA
      118 AMMONIAS
      176249 AMMONIA
            (AMMONIA OR AMMONIAS)
      477952 HYDROCARBON?
L2      69 PRODUC? (4A) AMMONIA (4A) HYDROCARBON?

```

```

=> s l2 and air separation
      846571 AIR
      255 AIRS
      846691 AIR
            (AIR OR AIRS)
      175241 SEPARATION
      6785 SEPARATIONS
      180940 SEPARATION
            (SEPARATION OR SEPARATIONS)
      529339 SEPN
      34187 SEPNS
      546592 SEPN
            (SEPN OR SEPNS)
      593643 SEPARATION
            (SEPARATION OR SEPN)
      3532 AIR SEPARATION
            (AIR(W)SEPARATION)
L3      0 L2 AND AIR SEPARATION

```

```

=> s l2 and separat3 (2a) hydrogen (4a) synthesis gas
3 IS NOT A RECOGNIZED COMMAND
The previous command name entered was not recognized by the system.
For a list of commands available to you in the current file, enter
"HELP COMMANDS" at an arrow prompt (=>).

```

```

=> s l2 and separat? (2a) hydrogen (4a) synthesis gas
      308546 SEPARAT?
      257962 SEP
      12500 SEPS
      269295 SEP
            (SEP OR SEPS)
      429806 SEPD
      3 SEPDS
      429809 SEPD
            (SEPD OR SEPDS)
      84891 SEPG
      1 SEPGS
      84892 SEPG
            (SEPG OR SEPGS)
      529339 SEPN
      34187 SEPNS
      546592 SEPN
            (SEPN OR SEPNS)
      1288276 SEPARAT?
            (SEPARAT? OR SEP OR SEPD OR SEPG OR SEPN)
      832771 HYDROGEN
      5409 HYDROGENS
      835808 HYDROGEN
            (HYDROGEN OR HYDROGENS)
      1137642 SYNTHESIS
      3 SYNTHESISES

```

62379 SYNTHESES
1172979 SYNTHESIS
 (SYNTHESIS OR SYNTHESISES OR SYNTHESES)
1374678 GAS
473270 GASES
1544425 GAS
 (GAS OR GASES)
14724 SYNTHESIS GAS
 (SYNTHESIS(W)GAS)
53 SEPARAT? (2A) HYDROGEN (4A) SYNTHESIS GAS
L4 0 L2 AND SEPARAT? (2A) HYDROGEN (4A) SYNTHESIS GAS

=> d his

(FILE 'HOME' ENTERED AT 10:32:42 ON 30 AUG 2004)

FILE 'CAPLUS' ENTERED AT 10:33:08 ON 30 AUG 2004

L1 2 S INTEGRAT? (3A) PROCESS (L) AMMONIA (L) HYDROCARBON?
L2 69 S PRODUC? (4A) AMMONIA (4A) HYDROCARBON?
L3 0 S L2 AND AIR SEPARATION
L4 0 S L2 AND SEPARAT? (2A) HYDROGEN (4A) SYNTHESIS GAS

=> s l2 and natural gas (l) steam (l) oxygen

622283 NATURAL
31 NATURALS
622301 NATURAL
 (NATURAL OR NATURALS)
1374678 GAS
473270 GASES
1544425 GAS
 (GAS OR GASES)
64722 NATURAL GAS
 (NATURAL(W)GAS)
193000 STEAM
408 STEAMS
193300 STEAM
 (STEAM OR STEAMS)
646502 OXYGEN
6323 OXYGENS
650917 OXYGEN
 (OXYGEN OR OXYGENS)
185 NATURAL GAS (L) STEAM (L) OXYGEN
L5 0 L2 AND NATURAL GAS (L) STEAM (L) OXYGEN

=> s l2 and hydrocarbon? (l) steam (l) oxygen

477952 HYDROCARBON?
193000 STEAM
408 STEAMS
193300 STEAM
 (STEAM OR STEAMS)
646502 OXYGEN
6323 OXYGENS
650917 OXYGEN
 (OXYGEN OR OXYGENS)
339 HYDROCARBON? (L) STEAM (L) OXYGEN
L6 3 L2 AND HYDROCARBON? (L) STEAM (L) OXYGEN

=> d l6 ibib ab 1-3

L6 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:18557 CAPLUS
DOCUMENT NUMBER: 140:255768
TITLE: Ammonia production from methane and carbon
dioxide-enriched air

INVENTOR(S): Chekhov, O. S.; Semagin, A. N.; Melent'ev, N. R.;
Polikarpov, A. V.; Perepelkin, A. I.
PATENT ASSIGNEE(S): Moskovskii Gosudarstvennyi Universitet Inzhenernoi
Ekologii, Russia
SOURCE: Russ., No pp. given
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2216515	C2	20031120	RU 2001-129531	20011102
PRIORITY APPLN. INFO.:			RU 2001-129531	20011102

AB In **prodn.** of **ammonia** from **hydrocarbon** materials, **steam** and air by compression of **hydrocarbon** material and removal of sulfur compds., **steam** and **steam** -air catalytic conversion of methane, conversion of carbon monoxide, removal of **oxygen**-containing compds. from the nitrogen-hydrogen mixture, compression, and ammonia synthesis in a closed cycle, CO₂ is added to the initial air at 0.001-0.124 of volume of produced mixture, and this mixture is directed for **steam**-air catalytic conversion of methane. The method reduces the specific consumption of **hydrocarbon** materials.

L6 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:18556 CAPLUS
DOCUMENT NUMBER: 140:255767
TITLE: Ammonia production from methane and nitrogen-enriched air
INVENTOR(S): Chekhov, O. S.; Semagin, A. N.
PATENT ASSIGNEE(S): Moskovskii Gosudarstvennyi Universitet Inzhenernoi
Ekologii, Russia
SOURCE: Russ., No pp. given
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2216514	C2	20031120	RU 2001-117617	20010628
PRIORITY APPLN. INFO.:			RU 2001-117617	20010628

AB In **ammonia prodn.** from **hydrocarbon** materials, **steam** and air by compression of **hydrocarbon** materials and removal of sulfur compds., **steam** and **steam** -air catalytic conversion of methane, conversion of carbon monoxide; removal of **oxygen**-containing compds. from nitrogen-hydrogen mixture, compression, and synthesis of ammonia in a closed cycle, N is added to the initial air at a N-air ratio of (0.001-1.121):1 and the obtained mixture is directed for **steam**-air catalytic conversion of methane. The method reduces the specific consumption of **hydrocarbon** raw materials.

L6 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:18555 CAPLUS
DOCUMENT NUMBER: 140:255766
TITLE: Ammonia production with additional conversion of partial mixture of hydrocarbon, air and water vapor
INVENTOR(S): Chekhov, O. S.; Semagin, A. N.
PATENT ASSIGNEE(S): Moskovskii Gosudarstvennyi Universitet Inzhenernoi
Ekologii, Russia

SOURCE: Russ., No pp. given
 CODEN: RUXXE7
 DOCUMENT TYPE: Patent
 LANGUAGE: Russian
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2216513	C2	20031120	RU 2001-117615	20010628
PRIORITY APPLN. INFO.:			RU 2001-117615	20010628

AB In NH₃ production from **hydrocarbon** materials, **steam** and air by compression and removal of sulfur compds., **steam** and **steam**-air catalytic conversion of **hydrocarbon** materials, conversion of CO, removal of **oxygen**-containing compds. from N-H mixture, compression, and NH₃ synthesis in a closed cycle, 0.42-0.0836 of the total air amount together with a portion of **hydrocarbon** materials and **steam** are subjected to addnl. **steam**-air catalytic conversion of the **hydrocarbon** materials, and the obtained mixture is directed to the main **steam**-air catalytic conversion. Heat of gases after the main **steam**-air catalytic conversion of **hydrocarbon** materials is used to heat gases entering this conversion step. The method reduces the specific consumption of **hydrocarbon** raw materials, e.g., CH₄.

=> d his

(FILE 'HOME' ENTERED AT 10:32:42 ON 30 AUG 2004)

FILE 'CAPLUS' ENTERED AT 10:33:08 ON 30 AUG 2004

L1	2 S INTEGRAT? (3A) PROCESS (L) AMMONIA (L) HYDROCARBON?
L2	69 S PRODUC? (4A) AMMONIA (4A) HYDROCARBON?
L3	0 S L2 AND AIR SEPARATION
L4	0 S L2 AND SEPARAT? (2A) HYDROGEN (4A) SYNTHESIS GAS
L5	0 S L2 AND NATURAL GAS (L) STEAM (L) OXYGEN
L6	3 S L2 AND HYDROCARBON? (L) STEAM (L) OXYGEN

=> s l2 and separat? (2a) hydrogen (4a) synthesis gas

308546 SEPARAT?
 257962 SEP
 12500 SEPS
 269295 SEP
 (SEP OR SEPS)
 429806 SEPD
 3 SEPDS
 429809 SEPD
 (SEPD OR SEPDS)
 84891 SEPG
 1 SEPGS
 84892 SEPG
 (SEPG OR SEPGS)
 529339 SEPN
 34187 SEPNS
 546592 SEPN
 (SEPN OR SEPNS)
 1288276 SEPARAT?
 (SEPARAT? OR SEP OR SEPD OR SEPG OR SEPN)
 832771 HYDROGEN
 5409 HYDROGENS
 835808 HYDROGEN
 (HYDROGEN OR HYDROGENS)
 1137642 SYNTHESIS
 3 SYNTHESISES

62379 SYNTHESSES
 1172979 SYNTHESIS
 (SYNTHESIS OR SYNTHESISES OR SYNTHESSES)
 1374678 GAS
 473270 GASES
 1544425 GAS
 (GAS OR GASES)
 14724 SYNTHESIS GAS
 (SYNTHESIS(W)GAS)
 53 SEPARAT? (2A) HYDROGEN (4A) SYNTHESIS GAS
 L7 0 L2 AND SEPARAT? (2A) HYDROGEN (4A) SYNTHESIS GAS

=> s l2 and extract? (2a) hydrogen (4a) synthesis gas
 257023 EXTRACT?
 282717 EXT
 211445 EXTTS
 441346 EXT
 (EXT OR EXTTS)
 333503 EXTD
 7 EXTDS
 333505 EXTD
 (EXTD OR EXTDS)
 48417 EXTG
 1 EXTGS
 48418 EXTG
 (EXTG OR EXTGS)
 365175 EXTN
 12416 EXTNS
 370417 EXTN
 (EXTN OR EXTNS)
 1012617 EXTRACT?
 (EXTRACT? OR EXT OR EXTD OR EXTG OR EXTN)
 832771 HYDROGEN
 5409 HYDROGENS
 835808 HYDROGEN
 (HYDROGEN OR HYDROGENS)
 1137642 SYNTHESIS
 3 SYNTHESISES
 62379 SYNTHESSES
 1172979 SYNTHESIS
 (SYNTHESIS OR SYNTHESISES OR SYNTHESSES)
 1374678 GAS
 473270 GASES
 1544425 GAS
 (GAS OR GASES)
 14724 SYNTHESIS GAS
 (SYNTHESIS(W)GAS)
 2 EXTRACT? (2A) HYDROGEN (4A) SYNTHESIS GAS
 L8 0 L2 AND EXTRACT? (2A) HYDROGEN (4A) SYNTHESIS GAS